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SEMIANNUAL HISTORICAL REPORT
Headquarters, Field Command
The Armed Forces Special Weapons Project
Sandia Base, Albuquerque, New Mexico

Activities for the period
1 January 1954 - 30 June, 1954

~~679 Pages, including 26 charts, 2 maps, 1 graph and 7 photographs, 1 Hist of Branch Cont.~~

by

John Wendell Bailey, Lt. Col., CMC
Field Command Historian

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The Armed Forces Special Weapons Project
Sandia Base, Albuquerque, New Mexico
1 January 1954 - 30 June 1954

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INTRODUCTION

The Armed Forces Special Weapons Project is a military interdepartmental agency activated 1 January 1947 to take over some of the functions of the Manhattan District, particularly those functions concerned with the military application of atomic energy.

The Operational Charter, dated 8 July 1947, (Revised SR 10-850-1, D.A. Washington, D. C. 9 August 1951), placed upon the Armed Forces Special Weapons Project (AFSWP) the responsibility for all military service functions of the Manhattan project as were retained under control of the Armed Forces, including training of special personnel required, military participation in the development of Atomic weapons of all types (in coordination with the Atomic Energy Commission), technical training of bomb commanders and weaponeers, and developing and effecting joint radiological safety measures in coordination with established agencies.

In the beginning, the personnel of the AFSWP came from the Manhattan District and was practically all Army. The interest of the Navy and Air Force has been reflected in the gradually increasing participation of these services. The proportionate participation of the services personnel in the activities of the Field Command, Armed Forces Special Weapons Project, as of 30 June 1954, is as follows:

	Authorized		Assigned	
Arm of Service	Number	%	Number	%
Army	2589	32.1	2997	37.1
Navy	2349	29.1	1720	21.4
Air Force	3135	38.8	3336	41.5
Totals	8073	100.0	8053	100.0

Headquarters of the Armed Forces Special Weapons Project are in the Pentagon, Washington, D. C. Headquarters of the Field Command, Armed Forces Special Weapons Project, are at Sandia Base, Albuquerque, New Mexico. The active Field Sites, under command jurisdiction of the Field Command, are as follows:

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The Semiannual History of the Field Command, Armed Forces Special Weapons Project for the period of 1 January 1954 - 30 June 1954, inclusive, is divided into ten parts, as follows:

PART I - General Administration, Headquarters, Field Command, AFSWP.

PART II - Service Branches Administrative Units.

PART III - Directorate of Administration.

PART IV - Directorate of Personnel and Security.

PART V - Directorate of Materiel.

PART VI - Directorate of Operations.

PART VII - Directorate of Weapons Effects Tests.

PART VIII - Special Groups.

PART IX - Sandia Base.

PART X - The Sites, A, B, C, D, and L.

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PART VII

DIRECTORATE OF WEAPONS EFFECTS TESTS

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DIRECTORATE OF WEAPONS EFFECTS TESTS

Colonel Paul T. Preuss, USAF, Director

I. ACTIVATION. The Directorate of Weapons Effects Tests was activated on 1 August 1952 in accordance with Headquarters, AFSWP, General Order Number 10, dated 18 July 1952, and Headquarters, Field Command, AFSWP General Order Number 50, dated 1 August 1952. In a letter from Chief of AFSWP dated 4 August 1952 to the Commanding General, Field Command, AFSWP, the responsibilities of Field Command were augmented to include certain functions as indicated below in the mission of the Directorate of Weapons Effects Tests.

A. Steps leading to present organization. In 1951, it became apparent that a permanent military organization was needed to direct and coordinate the military participation in continental atomic tests. Because the Air Force's Special Weapons Command (presently Air Force Special Weapons Center) was in existence and had previous experience in supplying support to the Atomic Energy Commission, the Joint Chiefs of Staff directed the Chief of Staff of the Air Force to establish such an organization. In accordance with this directive, the Special Weapons Command at Kirtland AFB established a Joint Test Group in the summer of 1951. After the experience of one operation, BUSTER/JANGLE in the Fall of 1951, the Commanding General, Special Weapons Command requested that he be relieved of this responsibility. Hence, on 18 January 1952, the three Chiefs of Staffs assigned to the Chief, Armed Forces Special Weapons Project the added mission of technical supervision of continental military weapons effects tests and the coordination of military participation and assistance to the AEC. Test Command, AFSWP was activated on 29 January 1952 to fulfill this mission for the Chief, AFSWP. Personnel assigned to the Joint Test Group were transferred to the Test Command with headquarters at Kirtland AFB. In June 1952, upon return from Operation TUMBLER/SNAPPER, conducted in the Spring of 1952, headquarters of the Test Command were transferred to Sandia Base.

B. From early June until the first of August 1952, Test Command personnel were actively engaged in completing preliminary

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reports of the operation. Meanwhile, preliminary planning by Headquarters, AFSWP had started for the proposed test series to be conducted in the Spring of 1953.

G. On the 7th of July 1952, Colonel P. T. Preuss, USAF, reported to Headquarters, Field Command and was assigned as Special Assistant to the Commanding General. Colonel Preuss was given the mission of studying the integration of Test Command activities and personnel into Headquarters, Field Command. Conferences were held with the Manager, NFOO; Colonel Hartford, Director of Test Operations for NFOO, on loan from Headquarters, Field Command; Dr. Graves, Los Alamos Scientific Laboratory; Headquarters, Field Command and Headquarters, AFSWP personnel. On 24 July 1952, Colonel Preuss submitted a report to the Commanding General, Field Command, recommending that the Test Command be de-activated and that its activities be assumed by a Directorate of Weapons Effects Tests, the Director reporting to the Commanding General, Field Command in the same fashion as the other directors report. This report was approved by the Commanding General, Field Command, and hand-carried to Washington by Colonel Preuss. On 29 July, this matter was discussed with General Loper and staff and was approved by General Loper. Pursuant to this decision of General Loper's, the Test Command was dis-established on 1 August 1952 and its responsibilities assumed by Headquarters, Field Command. In Headquarters, Field Command General Order Number 50, dated 1 August 1952, the Directorate of Weapons Effects Tests was established. Colonel Paul T. Preuss, USAF, was announced as the Director of Weapons Effects Tests in the same Field Command General Order.

II. MISSION. The mission of the Directorate of Weapons Effects Tests is to implement Field Command responsibilities in continental and overseas atomic tests. These responsibilities include:

A. Technical direction of weapons effects tests of primary concern to the Armed Forces and the weapons effects phases of the developmental or other tests of atomic weapons involving nuclear detonations within the continental limits and overseas.

B. Coordination of military participation and assistance in support of the Atomic Energy Commission in the conduct of tests

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of atomic weapons involving nuclear detonations within the continental limits of the United States.

III. ORGANIZATION. The organization of the Directorate of Weapons Effects Tests includes four main divisions: Technical, Operations, Support and the Nevada Proving Grounds Detachment, as shown on the attached charts. The present organization differs from the previous organization in that a Task Unit 13 was established on 1 July 1953 as a part of Task Group 7.1, and the branch office in Washington, D. C. was deactivated on 18 August 1953. Two minor changes were made during this period: the addition of an Office of Technical Director and an internal change within the Support Division. The Technical Director, Dr. E. B. Doll of Stanford Research Institute, on contract to AFSWP, acts in an advisory and supervisory capacity to the Director on technical matters pertaining to continental atomic tests. Changes within the Support Division decreased the number of branches from five to two. (See attached organizational charts).

Task Force 13, which was reported on in the previous history (July-December 1953) was deactivated on 15 June 1954, upon return of personnel from CASTLE overseas test.

IV. PERSONNEL. Key personnel assigned to duty in the Directorate during the period covered by this report are listed below, together with the date of their assignment to or detachment from the project:

Colonel Paul T. Preuss, 1407A, USAF Director	21 Jun 1952
Colonel H. K. Gilbert, 5412A, USAF Chief, Technical Division and CTU-13	10 Sep 1952
Colonel William W. Perry, 5498A, USAF Deputy Chief, Technical Division	1 Mar 1954
Colonel L. F. Dow, 5584A, USAF Chief, Operations Division	14 Mar 1952
Captain Neil H. Kingsley, 75346, USN Deputy Commander TU-13 (Detached 20 May 1954)	15 Mar 1953
Dr. E. B. Doll, Civilian Technical Director	17 Mar 1953

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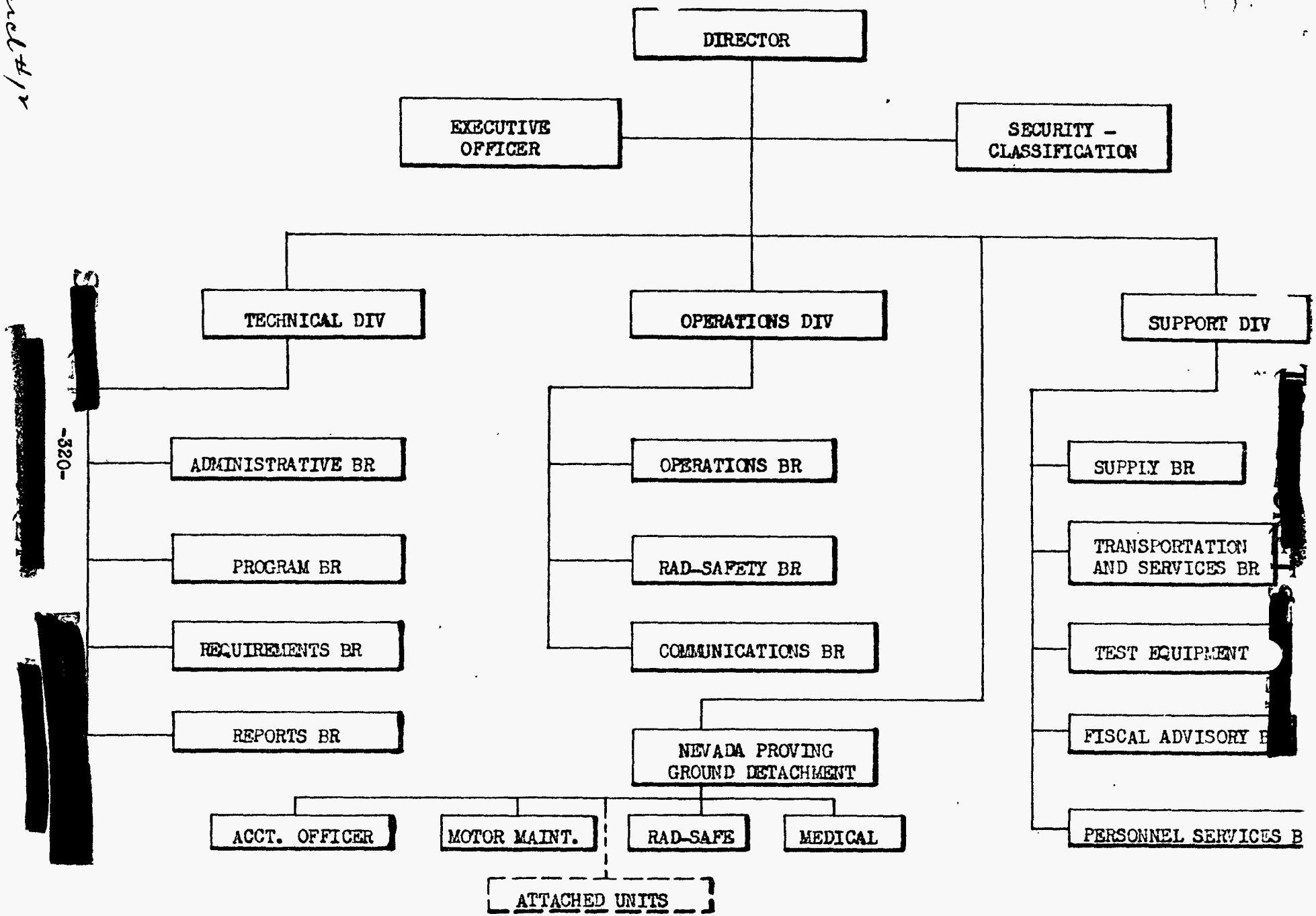
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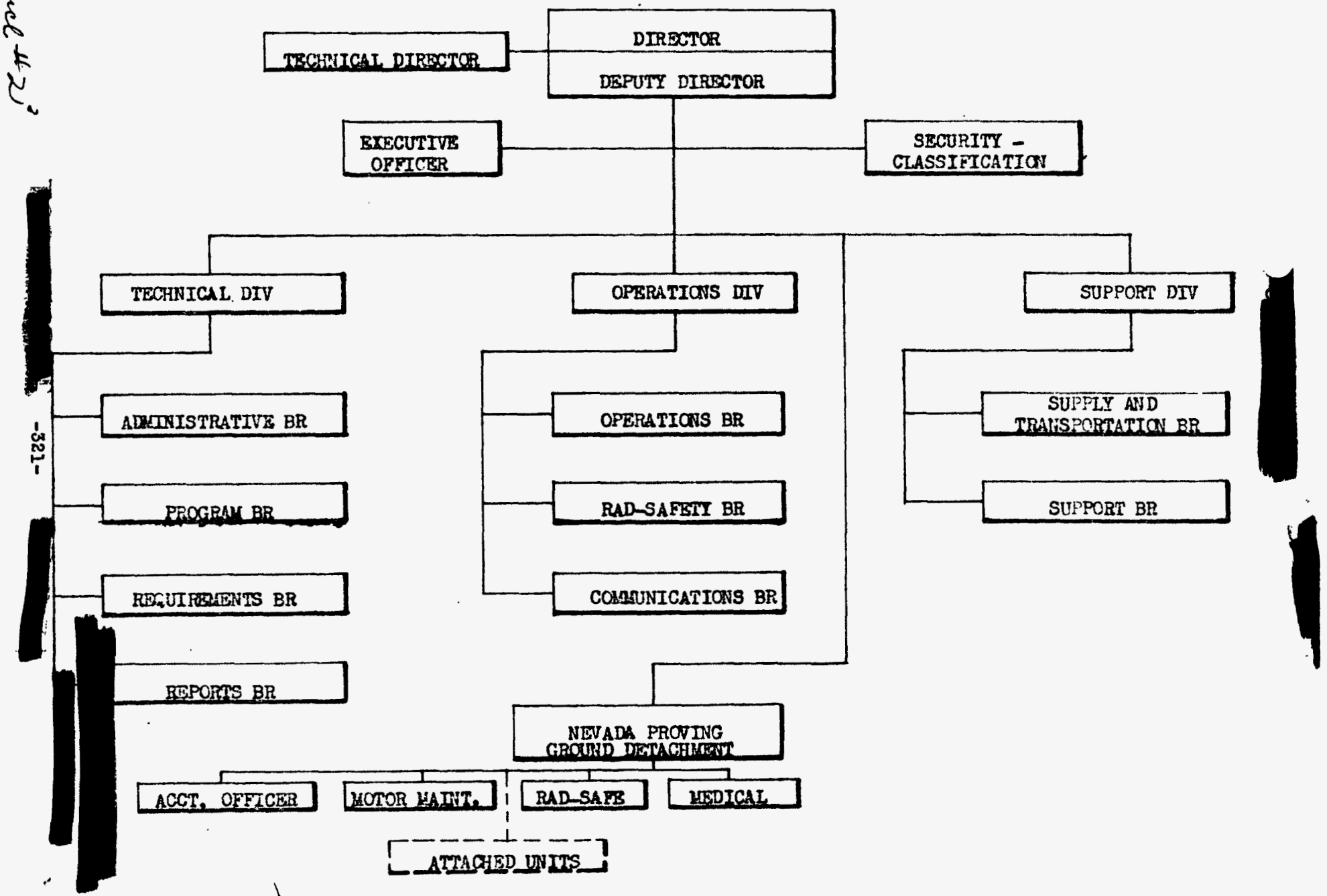
EXECUTIVE OFFICER
SECURITY - CLASSIFICATION
TECHNICAL DIV
OPERATIONS DIV
SUPPORT DIV
ADMINISTRATIVE BR
PROGRAM BR
REQUIREMENTS BR
REPORTS BR
OPERATIONS BR
RAD-SAFETY BR
COMMUNICATIONS BR
SUPPLY BR
TRANSPORTATION AND SERVICES BR
TEST EQUIPMENT
FISCAL ADVISORY B
PERSONNEL SERVICES B
NEVADA PROVING GROUND DETACHMENT
ACCT. OFFICER
MOTOR MAINT.
RAD-SAFE
MEDICAL
ATTACHED UNITS


TECHNICAL DIRECTOR
DIRECTOR
DEPUTY DIRECTOR
EXECUTIVE OFFICER
SECURITY - CLASSIFICATION
TECHNICAL DIV
OPERATIONS DIV
SUPPORT DIV
ADMINISTRATIVE BR
PROGRAM BR
REQUIREMENTS BR
REPORTS BR
OPERATIONS BR
RAD-SAFETY BR
COMMUNICATIONS BR
SUPPLY AND TRANSPORTATION BR
SUPPORT BR
NEVADA PROVING GROUND DETACHMENT
ACCT. OFFICER
MOTOR MAINT.
RAD-SAFE
MEDICAL
ATTACHED UNITS

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Robert A. Burgin, Civilian Publications Editor	30 Mar 1955
Lt. Colonel Charles T. Duran, 5631A, USAF Supply Branch	29 Jan 1952
Lt. Colonel Tom D. Gallison, 025868, USA Chief, Radiological Safety Branch	1 Dec 1952
Lt. Colonel John B. Connolly, 0369950, USA Operations Branch	15 Feb 1952
Commander Milton R. Dahl, 98612, USN USN, Programs Branch	19 Apr 1954
Lt. Colonel Warren A. Fackenthall, AO 564668, USAF USAF, Communications Branch	18 Feb 1952
Lt. Colonel John J. Haley, 0392252, USA Requirements Branch	10 Mar 1952
Lt. Colonel Herman S. Heaton, 5517A, USAF Reports Branch	29 Jan 1952
Lt. Colonel Jack G. James, AO 472176, USAF Program Director	15 Apr 1955
Commander John J. Lenahan, 88207, USN OIC NPG Detachment (Detached 31 January 1954)	19 Mar 1952
Lt. Colonel Edward A. Martell, 024668, USA Program Director	7 Oct 1952
Commander Waldron M. McLellan, 100165, USN Program Director	14 Mar 1953
Commander Harold B. Palmer, 102124, USN Executive Officer	30 Jan 1952
Commander W. E. Pantle, 242543, USN Engineer Staff Officer (Detached 22 June 1954)	9 Mar 1953
Lt. Colonel W. B. Pehlman, 024195, USA Programs Branch	24 May 1954
Lt. Colonel Donald I. Prickett, 9217A, USAF Program Director	27 Jan 1952
Lt. Colonel Raymond E. Spurgeon, 5651A, USAF Operations Branch	29 Jan 1952
Lt. Colonel Edward M. Tolliver, 025856, USA Chief, Support Division	15 Feb 1952
Major Ralph F. Aiello, 0397564, USA Security Officer	2 Feb 1952
LCDR Walton L. Carlson, 158545, USN Program Director	29 Jan 1952

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Major Elbert C. Jenkins, AO 421747, USAF Programs Branch	1 Nov 1953
Major Bill J. Harvey, 16149A, USAF Requirements Branch	1 Mar 1952
Lt. William S. Berkshire, 590144, USN Support Branch	14 Jun 1952
Lt. R. H. Gassen, 447191, USN Assistant Program Director (Detached 15 April 1954)	29 Jan 1953
Captain Harry R. Baildew, 01512006, USA Classification Branch	20 Oct 1952
Captain Raymond R. La Pointe, 01582751, USA OIC HPS Detachment	15 Feb 1952
Captain James G. Smith, O 1577861, USA Accountable Officer, HPS	1 Jul 1953
Captain Kendrick B. Throckmorton, AO 1548578, USAF Personnel Security Branch	1 Oct 1952
1st Lt. John H. Huntoon, 6981978, USA Administrative Branch, Technical Division	1 Feb 1953

V. ACTIVITIES. The Directorate of Weapons Effects Tests was engaged in two significant areas of activities during the period 1 January - 30 June 1954: participation in Operation CASTLE, and preliminary planning for Operation TEAPOT at the Nevada Proving Grounds in the Spring of 1955. The activities of the Directorate are noted below under six headings, viz:

A. Office of the Director.

1. The first official act of the Director during this reporting period was to visit Washington on 3 January at the direction of the Chief, AFSWP, to be present while a Joint Staff proposal was being discussed whereby AFSWP was to have been given the DOD responsibility for overseas tests as well as for continental tests. The preliminary ideas of Field Command were presented to General Luedecke. In a formal meeting of the Joint War Plans Committee, the Army and Navy Planners did not concur in the Joint Staff position, which was supported by the Air Force Planner, and the responsibilities remained status quo.

2. On 11-15 January, the Director attended a series of meetings in connection with TEAPOT planning. At a conference

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on 12 January with Dr. A. C. Graves, Los Alamos Scientific Laboratory, it was evident that LASL ideas of what might be fired were still nebulous and therefore not helpful in firming up DCD planning. A meeting on the 19th with Air Force Special Weapons Center representatives was particularly useful in that responsible individuals of AFSWC were briefed on the forthcoming requirements for the drop of a high altitude device of the order of 3-5 KT weighing about 3,000 pounds. At the same time conversations were initiated with representatives of the Development Division, Field Command, Sandia Corporation, and AFSWC representatives on what device might be suitable for the high altitude shot which at this stage of planning was the only firm DCD proposal for TEAPOT.

3. On 21 January, a conference was held with the Public Information Officer, Hq, AFSWP, and the Staff Public Information Officer, Hq, Field Command, to review UPSHOT-KNOTHOLE experiences in public information and to develop corrective action to improve DCD public information activities in the field during the next operation.

4. Personal negotiations over the past several months for the services of Dr. Edward B. Doll as Technical Director for Operation TEAPOT culminated on 2 February when Dr. Doll agreed to serve again.

5. On 5 February, the Director visited the Nevada Proving Grounds and conferred with the Manager, Las Vegas Field Office. The principal point discussed was the integration of DCD and AEC security personnel into one functional office for the next series of tests. The meeting with Mr. Woodruff indicated fullest concurrence in this principle.

6. On the 8th of February, the Director submitted a revised Table of Distribution to the Chief of Staff. The basic underlying thought in the new T/D was to provide sufficient personnel for two technical teams, thus enabling the Directorate to adequately handle continental and overseas responsibilities concurrently, since a long overlap exists in planning, execution and reporting.

7. On 15 February, Colonel Dow firmed up the necessary monetary details and communications requirements necessary to permit an Air Weather Service Detachment to study spring weather in the Nevada Proving Grounds during the months of March and April.

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8. On 18 February, the Acting Director was notified that the AEC had approved an additional well at the PPG, construction of two men's and one women's dormitories, and the erection of a quonset provided by AFSWP to the AEC to be modified as a theater.

9. The Director witnessed the first shot from aboard the USS ESTES, off Bikini, 1 March. Upon return to Eniwetok, it became evident that the unexpected fallout from the first shot had caused a considerable number of natives residing at atolls east of Bikini to be exposed to significant dosages of radiation. At the suggestion of Dr. Seaville and after conferring with Colonel C. S. Maupin, Dr. A. C. Graves and others, the Director contacted Major General P. W. Clarkson, USA, and suggested that a team of bio-medical experts be requested to examine in detail the condition of natives exposed to this radiation. General Clarkson did not wish to make this suggestion himself but authorized the Director to dispatch a message to Chief, AFSWP suggesting such a team. Immediate action was taken by the Chief to dispatch a team and to establish as an additional effects project, Project 4.1, Study of Response of Human Beings Accidentally Exposed to Significant Fall-Out Radiation.

10. The Director met the Commanding General, Field Command, AFSWP, at Eniwetok during the first week in March and accompanied him on an inspection of TU-13 activities and other related Task Force activities. The Director also accompanied the Commanding General on various visits to USS ESTES in anticipation of the firing of the second shot. Due to prolonged delays, the Commanding General and the Director departed the PPG 24 March, aboard General Clarkson's aircraft in company with Mr. Lewis Strauss, Chairman of the Atomic Energy Commission. The Commanding General and the Director returned to Sandia Base on 29 March.

11. On 2 April, the Director in a telephone conversation with Dr. Doll agreed in principle to a revised contract covering Dr. Doll's services plus additional services provided by Stanford Research Institute in connection with Dr. Doll's serving as Technical Director.

12. On the 9th of April, the Director conferred with Generals Luedecke and Stranathan on over-all reactions to Operation CASTLE. General Luedecke had just returned from a visit to the PPG. In the same conversation the question of future organizational

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philosophy on the continental proving grounds was raised. General Luedecke requested that Field Command submit a study to him on the question of reorganization.

15. On 14 April, in company with Dr. Doll, the Director conferred with Drs. Froman and MacDougall. In this meeting information was developed that the Los Alamos Scientific Laboratory was not planning the development of an optimized 22" system and that in their opinion the DOD needs for a high altitude device could best be met by a [redacted] Dr. Froman stated that the Laboratory, from a development standpoint, was not interested in the DOD proposed high altitude operation. This conference developed further the fact that the development program of Los Alamos might not contain sufficiently suitable development shots to permit many of the measurements which the DOD considered essential for weapons effects information.

16. The Director, in company with the Commanding General, made a trip to Washington on 26 April. During this visit the Chief, AFSWP approved Field Command's proposals on organization for continental tests (Letter, subject: "Organization for Continental Tests" dated 23 April 1954) and also accepted for further study Field Command's proposals on the modified public relations responsibilities and increased supervisory control over Desert Rock operations.

17. On the 29th of April, the Director attended a conference at Wright-Patterson Air Force Base in which different interested agencies in the proposed drone program were present. As a result of this drone conference, in which it appeared that the Air Force needs for a suitable burst were rather stringent, and further, as a result of a growing belief that AEC would not permit a sizable underground and surface detonation at EPG, it became clear that the current proposal for DOD shots in TEAPOT (high altitude, 10 Kt surface and 10 KT underground) would not achieve the fullest objectives as expressed by the three Services. Dr. Doll therefore prepared an alternate program which was discussed with General Luedecke, Dr. Doll and the Director on 20 May. General Luedecke approved an alternate program subject to the approval of the Secretary of Defense and the Joint Chiefs of Staff consisting of a high altitude shot and an effects tower shot of a modest Kt yield. Prior to submission of this alternate program

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to the Assistant Secretary of Defense (RAD), a third shot, a 1 KT underground, was added at the request of the Army.

16. In late May and early June, the officers assigned to TU-13 returned to the Directorate.

17. During June, the Chief, AFSWP, announced specific priority requirements for the weapon aspects of the device to be used in the high altitude test. As first priority, the Chief, AFSWP, desired an optimized 22" system with a yield of 2 KT to be carried in a Mark 5 shape with a gross weight of 1500 pounds. Sandia Corporation was formally advised of these requirements and action was initiated. AFSWC was formally advised of these requirements and steps were taken to do the concurrent air drop work in ballistic reduction.

18. During the month of June, more specific conversations were initiated on TEAPOT upon the return from CASTLE of Dr. A. C. Graves and other key individuals in the test program. Further, the Director was advised that the Assistant Secretary of Defense (RAD) had approved the alternate TEAPOT program consisting of the high altitude shot, the military effects tower shot and the 1 KT underground shot.

19. On 29 June, the Director conferred with a Collier's magazine representative, in company with Major Hunter, Staff Public Information Officer, in reference to a proposed article on Field Command.

B. Executive Office. This office was established to maintain continuity in the frequent periods of absence of the Director on TDY, in addition to the routine responsibilities of an administrative type office. During this reporting period, the Director was on TDY approximately one-third of the time. In the absence of any Deputy Director, the next senior officer became Acting Director and, since the senior officer present changed several times, it became a distinct advantage to have one single office to maintain a continuity of action on these matters of primary interest to the Director.

1. The activities of the Executive Office during this period remained of a routine nature, however, this period of

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decreased activity was utilized to good advantage in reviewing old files for purposes of destruction, downgrading and consolidation. On the recommendation of the TEAPOT Planning Group in Headquarters, AFSWP, a separate TEAPOT filing system was established within the Directorate to facilitate the incorporation of the Group's files with those of the Directorate's at a later date. In coordination with the Directorate of Weapons Effects Tests (DWET) Security Officer, a system of quarterly inventories of Secret documents was established within the Directorate which accomplished two main objectives; namely, the status of accountability of documents within the Directorate and a sizable decrease of classified material in convenience and working files. As of 30 June 1954, the status of all Secret material has been determined except for that material which is charged to the Technical Division. Since it was necessary for TU-13 to take a substantial percentage of material from the Technical Division files overseas and, since material was received from various sources by the Task Unit while overseas during Operation CASTLE, it was necessary to process all material through the DWET Mail and Records Section upon the return of TU-13 files for incorporation with DWET files. The process of incorporation was done as expeditiously as possible so that in no way would it delay the preparation of the preliminary reports of Operation CASTLE. The Technical Division is presently finishing its required inventory and, upon completion, it is anticipated the status of Secret documents within the Directorate will be satisfactory. Top Secret documents have been held to an absolute minimum and, to date, only one is being held within the Directorate. Since the operation of the Directorate is somewhat unique in that the whole Directorate or a portion must move back and forth to proving grounds for operational periods, more stringent control of classified material must be enforced than would normally be expected. The above actions, where applicable, had been coordinated with the Field Command Adjutant General and guidance and suggestions from that office were of significant value to the Directorate.

2. In furtherance of the above and to provide for an organization flexible enough to operate both at the proving ground and at Sandia Base as a split team supplemented with augmentation personnel or as a unit at either place, the following improvements have been made:

a. Working methods and record systems have been simplified.

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b. Organization was simplified and functional responsibilities have been placed on individuals in accordance with an SOP and Functional Chart.

c. Each job description includes training and assistance to the next senior position to insure understudies and trained replacements.

d. The consolidated increase in Table of Distribution anticipated during the last reporting period has been approved at Field Command level and, even though action has been taken to fill the positions with permanent personnel, temporary help from the student pool has been utilized with the resulting handicaps and disadvantages associated with a high rate of turnover and partially trained people. This situation is temporary, however, and corrective measures should be well in hand during the early part of July and August.

C. Security Office.

1. During this period, the program for the clearance of TU-13 personnel participating in Operation CASTLE was completed.

Total "Q" clearances granted - 380
Total Military clearances granted - 14

2. Measures to implement the provisions of Executive Order 10501 were initiated and completed. The most important aspects of this Executive Order most vigorously administered by DNET were:

a. Review of all classified files and films for the regrading, downgrading, turn-in or destruction.

b. Review of all Restricted Security Information documents for either downgrading to Unclassified or upgrading to Confidential.

c. Physical inventories of classified Secret documents.

3. DNET Security Memorandums were drafted and published. Serving dual purposes, the Security Memorandums are

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guides for personnel in their responsibilities under such Security Directives as AR 380-5, NC Bulletin 205 series and Executive Orders; and, to implement such portions of these directives as are applicable to DNRF. The following were published:

Security Memo No.	1-54	Safeguarding Military Information Security of Matter in Storage	21 Jan 54
	2-54	Security Education	25 Jan 54
	3-54	Safeguarding Classified Information Preparation, Handling and Filing of Classified Documents	26 Jan 54
	4-54	Access Procedures	15 Jun 54

4. As requested by the Chief, AFSWP, the Frenchman's Flat area was inspected on 5 February 1954 to determine the classification of existing structures. A recommendation was made to the Chief, AFSWP, that the classification of the structures be downgraded to Unclassified.

5. During this period several conferences were held with Mr. E. Hightower, Security Officer, Las Vegas Field Office, USAEC, and Mr. J. McCrew, Security Office, Santa Fe Operations Office, to discuss the integration of AEC and DOD security operations during tests at NPG. The meetings culminated with the drafting of a proposed AEC-DOD Security Agreement; a compilation of security instructions embodying AEC and DOD security precepts for inclusion in the NTCC Administration Order; an Organizational Chart of the integrated organization; a functional chart; and allocation of office space.

6. Security lectures covering all phases of security and classification were presented to all DNRF military and civilian personnel on 2 April 1954. Each newly assigned person was given an individual security briefing of approximately one (1) hour duration prior to assignment to a division or office.

7. A security inspection was conducted on 7 April 1954 by Mr. H. Fish, Intelligence and Security Division, Field Command. During his critique of the inspection with the Director, Mr. Fish announced that the results of the inspection were satisfactory insofar as he could determine.

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D. Technical Division. During this period, the Technical Division was engaged in directing the activities of the various DOD groups participating in the military effects program of Operation CASTLE at the Pacific Proving Grounds, including the writing of the preliminary reports thereto; pre-planning of the military effects program for Operation TEAPOT, along with the coordination of the development of a device for use on the high altitude shot; and the preparation of the final reports on Operation UPSHOT-KNOTHOLE.

1. CASTLE History.

a. During the period from 1 January to 15 May 1954, the Technical Division, less the Reports Branch and a portion of the Requirements Branch, participated in Operation CASTLE at the Pacific Proving Grounds. Within the task force organization, the Technical Division was designated as Task Unit 13 of Task Group 7.1, the Scientific Task Group. The mission of the Task Unit 13 was to exercise technical direction of the various project groups participating in the weapons effects program of Operation CASTLE.

b. The technical results of the weapons effects program have been published in a series of preliminary test reports covering each individual project.* A summary of the entire program with pertinent data as to shots, dates, yields, etc., has also been published.**

(1) On-Site Phase.

(a) General - Headquarters Task Unit 13 began its movement overseas early in January 1954 and by 24 January all personnel of the headquarters were present in the forward area. Project personnel arrived at varying times depending on their scheduled participation. However, by 1 February each project had at

* ITR-901 through ITR-935, Interim Test Reports of projects participating in Operation CASTLE.

** ITR-934, Summary of Weapons Effects Tests, Military Effects Program.

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least one representative in the forward area. Office and laboratory space for the headquarters and all project groups was made available on Parry Island. For some projects and for the larger portion of the headquarters, it was necessary to utilize tents for office and working space on Parry. Project 6.6 manned a station on Rongerik Atoll (Eniwetok Island) through the first of March, at which time the station had to be evacuated because of radiological contamination. Project 1.6 operated remote stations on Wake and Guam throughout the operation. Project 6.2 maintained an office on Parry Island; however, the bulk of the project personnel were stationed on Eniwetok Island since the aircraft were operating from that location. During the on-site preparation work at Bikini Atoll, all project groups were assigned space in a tent compound on Taro Island at Bikini. After the first shot, the camp and working space on Taro was abandoned due to the contamination of that island and all personnel were forced to move aboard ship for the remainder of the operations in that area, although it was possible to utilize storage areas on Nan and Taro.

(b) Organization - Upon arrival in the forward area Task Unit 13 was organized with five divisions, i.e.: Administration and Personnel; Supply/Transportation; Operations; Technical Program; and Project Groups. Personnel assigned to the headquarters as of 24 January were as follows:

Col. H. K. Gilbert	USAF
Captain N. E. Kingsley	USN
Lt. Col. D. I. Prichett	USAF
Lt. Col. E. A. Martell	USA
LCDR W. L. Carlson	USN
Lt. Col. J. C. James	USAF
Major B. Bavey	USAF
Captain J. F. Steeleman	USA
Lt. D. N. Hartman	USAF
M/Sgt C. L. Gellert	USA
M/Sgt M. A. Carlson	USA
S/Sgt E. J. Williams	USAF
YEM C. F. Rosenkrans	USN
Pvt 2 R. E. Nehring	USA

In addition to the above, CDR McLellan was assigned to duty with J-6 of Headquarters, Task Group 7.1. In this capacity, he

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coordinated all TU-13 Engineering and Construction requirements. After the first shot, on 1 March, Lt. Col. Fackenthall joined TU-13 to assist in coordinating the Raydist operation. Captain Steelman departed from the forward area approximately 10 April due to previously agreed upon commitments to attend the weapons effects course at Sandia. Mr. Burgin arrived in the forward area approximately 21 April to assist in the preparation of preliminary reports. In addition to the headquarters personnel, four representatives of Headquarters, AFSWP visited the forward area during March and April. Lt. Col. Lavier and LCDR Christenson arrived in the forward area shortly after the first shot and were of considerable assistance to the headquarters during the period of their visit. Major Brandenberg and CDR Paine spent most of the month of April in the forward area working with Programs 2 and 3.

(2) Shot Period

Date	Device	Shot	Estimated Yield	Location
1 March	DELETED	Bravo	DELETED	Reef SW Namu
11 March		Union		Barge S Yurochi
22 March		Yankee		Barge S Yurochi
29 March		Echo		Eberiru
5 April		Nectar		Same as Union
15 April		Romeo		Same as Union
22 April		Koon		Eninman

The following table shows the same data for the shots as actually fired:

Readiness Date	Date Fired	Shot	Device	(Prelim.) Yield	Location
1 March	1 March	Bravo	DELETED	15 MT	Reef SW Namu
11 March	27 March	Romeo		11 MT	Bravo Crater
2 April	7 April	Koon		110 MT	Eninman
16 April	28 April	Union		7 MT	Barge S Yurochi
5 May	5 May	*Yankee		13.5 MT	Barge S Yurochi
21 April	14 May	Nectar		1.7 MT	Nike Crater

* Yankee device was changed to DELETED

NOTE: Echo Shot was cancelled on 15 April.

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Some of the deviations from the original schedule which should be noted are as follows:

One shot gave a yield [redacted] the predicted.
One shot gave a yield [redacted] the predicted.
One shot for which extensive instrumentation had been prepared was cancelled and no other shot was fired at the location.

Maximum variation between the original planned shot dates and actual shot dates ranged from 15 days early to 45 days late.

(a) Narrative Account of Shots

1. Bravo

a. The first shot was detonated on schedule on Nemu Island at 0645, 1 March 1954. The wind pattern at shot time was such that the fall out was very heavy on most of the island of the atoll. Typical readings at H+5 hours were as follows:

Fox 250R (estimated from aerial survey)
Nan 80-40R (measured on ground)
Tare 25R (estimated from aerial survey)

b. The firing party had remained in the bunker on Nan during the shot and therefore it was necessary to maintain a capability for emergency evacuation of these people. This required several of the Task Force ships to remain close enough to Nan so that voice radio communication could be maintained and helicopter flights could be dispatched if necessary. The positions of these ships were such that several received rather heavy fall out and although the exposures received by individuals aboard the ships were, for the most part, well within the tolerance limits, several project personnel received a significant proportion of their allowable exposure. Much valuable experience was gained by the rad-safe personnel of these ships. It is interesting to note that the two drone liberty ships (YAGs) of Project 6.4, which were attempting to get into a fall out area, came out of this shot with little or no contamination. The long range fall out resulted in the evacuation to Kwajalein of the natives from several atolls to the East of Bikini, and gave rise to the initiation of an additional effects experiment designed to determine the effects of significant radiation dosages on humans.

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c. Because of the heavy contamination of the atoll, the USS Bairoko, USS Estes, USS Curtiss and the USNS Ainsworth returned to Eniwetok during the evening of shot day so that recovery plans could be revised and personnel could be shifted between the various ships in preparation for ship-based operations at Bikini. It was decided that occupancy of the island camps at Bikini would not be radiologically safe for the remainder of the operation. The ships returned to Bikini the night of 2 March and recovery operations proceeded according to schedule.

2. Romeo

a. Because of the slight damage to the Koon installation on Yuro as a result of the Bravo shot, and the fact that the next scheduled shot, Union, might give a yield as large as Bravo and cause additional damage, it was decided to fire Romeo next. To maximize the distance from zero point to Yuro, it was decided to fire Romeo in the Bravo crater instead of on the barge located south of Yurochi. Romeo was selected in preference to the other devices since it was felt that, of those devices which could be made ready in the short time available, it was the least likely to produce a yield of more than DELE[redacted] thus minimizing the chances of further damaging the Koon installation.

b. The readiness date for Romeo was set as 11 March 1954, and the majority of Task Unit 15 projects were ready on that date. Some instrumentation had been very hastily installed, however, and the long delay period which followed enabled several groups to improve their equipment and put in additional stations. On 10 March, it was decided that the shot would have to be delayed 24 hours since some of the diagnostic tests could not meet the 11 March date with a reasonable degree of confidence. The weather was not satisfactory on 12 March and a 48 hours delay was ordered. Successive delays were ordered until 19 March at 0730, when it was announced that 20 March would be shot day. Suitable weather did not develop, and further delays were necessary. During this period it was necessary to maintain a capability for firing on 18 hours notice.

c. At 0730 on 26 March, it was announced that the weather looked favorable for 27 March and,

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after considerable last-minute scheduling of helicopter and small boat missions, all Task Unit 13 projects were ready. Romeo was detonated successfully at 0630 on 27 March.

d. A helicopter survey of the atoll was made at 0900 and very little contamination was found on any of the islands to the south and west of ground zero. A rather sizable water wave was generated, covering the airstrip on Taro with rocks and boulders. The obstructions were cleared in a few hours and C-47 flights were operating from the strip by 1600. All ships returned to the lagoon and anchored off Nan at 1600. Recovery and re-instrumentation proceeded without delay.

3. Koon

a. Although the decision to fire Koon after Romeo was made shortly after the Bravo shot, there was some question as to how much time would be required to prepare for the shot once Romeo had been fired. For planning purposes, it was assumed that all participants could be ready by 2 April, and project activities were scheduled accordingly. Because of the nature of the Koon device and the time required for its arming, it was necessary for all projects to complete their final station checks prior to 1100 of shot day minus one, and evacuate to their assigned ships. No projects failed to complete their work because of this restriction.

b. Some serious concern was expressed by representatives of Scripps Institute of Oceanography that the Koon shot might generate a Tsunami in the deep water of the ocean outside the lagoon. In anticipation of such a wave, two Scripps scientists were put aboard the PC 1546 which took up station off Sifo Island of Ailinginae Atoll, about 80 miles east of Bikini. In the event that a Tsunami was generated, it could be readily observed at Ailinginae and a warning message could be sent to the Task Force for dissemination to other areas which might be affected.

c. On 5 April it was announced that the weather might be favorable for firing on 8 April. All preparations were completed on schedule and the ships moved to their rendezvous area outside the lagoon, south of Nan at 1200.

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At 0100, 6 April, the shot was postponed for 24 hours, however, the ships remained at sea. During the morning, it was discovered that one of the Raydist stations was not operating properly and a request was made for a helicopter flight to take a Raydist technician to each of the stations for a check. The technician was transferred by high line from the USS Curtiss to a destroyer, thence by high line to the USS Bairoko, then by 'copter to the stations and return to the USS Bairoko at 1815.

d. At 0620, 7 April, the weather was very cloudy and some concern was expressed that the shot might not be fired because of a rain squall between Tare and Nan. However, conditions apparently were suitable and the shot went on schedule. A faint glow was observed beneath the low clouds, but this dissipated rapidly and nothing further was observed from the ships. The early helicopter survey reported heavy fall out on Uncle, practically none on Choe or Nan, and a significant amount on How and George indicating that the cloud had moved out of the lagoon in a northeasterly direction as predicted. The low yield of this shot was particularly discouraging because of the extensive effort which had gone into the blast lines on Tare and Uncle, the structure on Uncle, and the forest studies which were to be made on Uncle, William and Victor.

4. Union

a. Prior to the Koon detonation, a readiness date of Koon plus 9 days had been established for Union, thus setting the date as 16 April. The shot location remained as originally scheduled, making Union the first barge shot in open lagoon waters, southerly of Dog Island.

b. The land based instrumentation for DOD projects participating "on-site" was largely confined to islands of the Dog-George complex. Exceptions to this were projects 2.5b and 2.1 which had stations generally distributed around the atoll and project 1.2a which had stations on the Choe-Tare complex. Although some radioactive contamination remained from preceding shots in the Able-Charlie region and the Dog-George region, no critical radsafe problem was imposed in preparing for the shot.

c. Although all personnel lived aboard ship, with the ships in the vicinity of Nan (except

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the USS Curtiss which was near site zero) it was possible to use the helicopter pads at Nan and Tare, and also use Nan as a working area for storing, sorting and assembling material and gear. The project under particular pressure in meeting the readiness date was project 1.6 which, in addition to recovery of instrumented buoys from Romeo, placed nine instrumented buoys for Union.

d. On the scheduled Union minus one day all projects for which it was necessary activated their stations. All projects were ready as planned. The ships evacuated the lagoon shortly after noon and took position to the southwest. At about 2300 a 24-hour delay without reentry to the lagoon was announced because of predicted adverse weather. On the next morning a helicopter lift was made from the carrier to permit project 1.6 to reactivate its clock actuated stations. At 1520, an indefinite delay was announced, a helicopter mission was flown to disarm the device, and the ships reentered the lagoon. Until 25 April, the days were successively observed as Union minus two days with the understanding that the shot might go on 24 hours notice. At 1230 on 25 April, word was received that the following day, 26 April, was designated shot day to take advantage of unexpected weather change. In spite of the lateness of the announcement, all DOD projects were ready by 1730. All ships except the USS Estes (which waited for the arming party to return at 2300) evacuated the lagoon by 1930.

e. Union was detonated at 0610 on 26 April. At 1430, a radsafe and damage survey was made by helicopter. This survey revealed that the Tare airstrip had boulders and rubble thrown up on it by wave action, the Dog-George complex had been completely inundated by wave action, and that the eastern islands from George around to Oboe had suffered partial inundation. In addition, extremely high (order of 20 R/hr) radiation levels were reported for the Dog-George complex, and moderately high levels for How and Nan. The ships reentered the lagoon and anchored near Nan at 1630. Limited recovery was carried out that afternoon. The operations on the following days were tailored to effect recovery from Union prior to the detonation of Yankee at the same site zero with a scheduled readiness date of Union plus 9, to instrument for participation in Yankee, and to avoid radiation overdosage of personnel engaged in these operations. To accomplish the preceding it was necessary for

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certain recovery parties to work for limited times in areas (on Dog-George complex) in which the radiation field was as high as 2000 mr/hr. This was done, although for some individuals it was necessary (because of prior dosage) to increase the maximum permissible exposure for the operation from 3.9R to 6R.

f. The Tare airstrip was reactivated on 29 April, which greatly facilitated the arrival of replacement personnel (with low accumulated dosage) from Eniwetok. In addition, Man Island was radsafe by Union plus 5 for use as an assembly, sorting and storage area. This greatly facilitated the roll-up of those projects not participating in Yankee.

g. Project 1.4 was again under considerable pressure to effect recovery, repair damaged instrument buoys, and install a buoy array for Yankee. However, this problem was alleviated by the assignment of an additional (making two) fleet tug (ATF) to the project.

5. Yankee

a. As indicated in the preceding paragraph, the planned time interval between Union and Yankee made expeditious recovery from Union and preparation for Yankee mandatory. The recovery and roll-up activity was greater than that for participation in Yankee. This participation was limited by exhaustion of test material and equipment in prior shots, damage to shore installations from the wave action of Union, anticipated more severe wave action from Yankee, and by the fact that some projects had obtained adequate useful data from prior shots. As a result, no instrumentation was shore-based except for a few stations on the Dog-George complex, on the Oboe-Sugar complex, and one station each on How and Man. Project 1.4 (underwater pressure measurements) installed eight instrumented buoys in the lagoon and Project 1.6 (wave measurements) established its instrumentation in the lagoon.

b. On the scheduled Yankee minus one day, preparation was complete and instrumentation activated as necessary. By 1930, the ships, except for the USS Estes, evacuated the lagoon. The USS Estes, after return of the arming party, cleared the lagoon about 2130.

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c. On the scheduled Yankee day, the device was detonated at 0610. A radsafe and damage survey was made at 0930. This revealed high radiation levels in the Dog-George complex and on How and Nan. It also revealed that wave inundation had been greater than that for Union. The ships reentered the lagoon to the Nan anchorage at 1700. The only recovery for the DOD program on this day was records from an instrument shelter on Oboe.

d. The USS Estes departed Bikini on the evening of Yankee day, the other ships remaining to effect recovery and roll-up. On Yankee plus one, recovery was made by helicopter for all land instrument stations of the DOD program. This necessitated entry (in Dog-George complex) to areas reading as high as 10 r/hr, but this was accomplished without over-exposure of personnel. Project 1.6 was also able to make recovery of its lagoon stations on Yankee plus one day. Thus, on the evening of Yankee plus one, only Project 1.4 had yet to make recovery. This recovery, to minimize contamination to the two ATF's making the recovery, was not started until Yankee plus three. The recovery was then made without incident and completed by Yankee plus five. As of Yankee plus six, all Task Unit 15 personnel had cleared the Bikini area, and arrangements had been made for shipment of all material to be evacuated from the Bikini area.

6. Nectar

a. The original readiness date for Nectar was 21 April. As of this date, the Union shot was also ready to be fired at Bikini so that it was necessary to maintain a 24 hour capability for firing at either site. On 27 April, the weather forecast indicated favorable winds for the following day, however, at 0550 on 28 April the winds were unsatisfactory and the shot was postponed at that time. On 3 May, at 1630, it was announced that Nectar would be fired the following day, however, this was cancelled at 2330 with an announcement that Yankee would be fired on 6 May at Bikini. The next serious attempt to fire Nectar was 13 May, however, last minute winds were not favorable and the shot was postponed at 0510. On 13 May, the wind trend appeared favorable, each succeeding wind run indicating a more favorable situation, and at 0620 on 14 May Nectar was fired.

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Local weather was very poor, a condition which usually accompanies a southerly flow. Aside from cloud photography, the adverse weather conditions did not seriously affect TU-18 experiments. No measurable fall out was detected on Parry or Eniwetok Islands. Heavy rain showers during shot day, plus the very favorable wind situation, resulted in lower than expected contamination on the islands adjacent to the shot site. Recovery operations proceeded ahead of schedule and were completed, except for the underwater pressure instrumentation by N/S.

(3) Program Activities

(a) Program 1. Prior to the first shot, three complete blast lines had been constructed - two at Bikini and one at Eniwetok. These three blast lines were operated by the Sandia Corporation for making air blast and related measurements along the surface of the ground at varying distances from the various shots (Projects 1.2a, 1.3, 1.7). Of these three blast lines, only the one located in the northwestern portion of Bikini Atoll obtained useful measurements. The blast line on the southern portion of Bikini operated satisfactorily, but the results were of little value due to the low yield of Shot 3. The blast line at Eniwetok was not used because the shot for which it had been constructed was cancelled. One additional line was constructed toward the end of the operation to take advantage of Shot 6, which during the operation was rescheduled from Bikini to the Mike crater at Eniwetok.

(b) Measurements of underwater pressures were made under project 1.4 by a group representing the Office of Naval Research, Naval Research Laboratory, Naval Ordnance Laboratory and David Taylor Model Basin. The operational difficulties encountered by these groups were at times extremely severe, primarily due to the scarcity of proper support ships, the continued delays in the shots and the rough conditions of Bikini Lagoon. One ATF and Floating Dry Dock (ARSD) were required by the project almost continuously, however, there were frequent occasions when the demand for these two vessels for other tasks made it necessary to temporarily suspend the work of project 1.4. It was necessary, because of the frequent postponements of shot dates, to visit the instrument stations daily and any interruption in the availability of the support ships reduced the chances of obtaining useful data from the instrumentation. The Navy Task Group (TG 7.3) made every

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effort to support this project to the fullest extent, however, in a future operation of this type provision should be made for permanent assignment to the project group of the required support ships. Project 1.6 conducted by the Scripps Institution of Oceanography maintained several floating lagoon stations and a number of shore recording stations for measuring water wave heights. Their support requirements were somewhat modest in comparison with those of Project 1.4 and they were able to maintain their stations in readiness for the shots, in spite of the excessive delays in the shots, with the assignment of one specially modified LCM. In general, Program 1 was able to accomplish its assigned mission. The overall results obtained by Program 1 were somewhat less than had been anticipated due to the extreme variation in yields of several shots, the cancellation of one shot and the change in the location of several of the shots.

(c) Program 2. In Program 2, measurements were made of the total gamma radiation on all shots and the gamma radiation versus time on three shots, neutron flux and spectrum on 2 shots and fall out on all shots. Measurements of total gamma presented no unusual operational problems since these measurements were made by means of conventional film badge dosimetry. The equipment for measuring the gamma rate as a function of time functioned satisfactorily on the first shot, however, the extremely high yield of this shot not only damaged many of the measuring stations but also caused a fire in the administrative compound on Taro which destroyed a large proportion of the projects spare equipment. For this reason, participation in succeeding shots was extremely limited and very few stations were activated. The neutron measurements were reasonably successful on the first two shots although considerable damage was done to the close-in stations and residual contamination prevented early recovery, thus decreasing the usefulness of the information. The fall out program presented the most difficult operational problem in the effects program. Fall out measurements were made in three general areas; within the lagoons, on available land masses and in the open sea. Measurements within the lagoon were made by means of anchored floating raft stations equipped with appropriate collector devices. The extremely rough water of Bikini lagoon resulted in the loss of a number of stations even before the first shot due to an unsatisfactory anchoring arrangement. The high yield of the first shot overturned many of the rafts, thus destroying their usefullness for collecting fall out

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samples for that shot. In addition, a number of rafts were torn loose and were not recovered. The wind situation for Shot 6 was such that there was very little fall out within Eniwetok lagoon. In order to document the fall out in the open sea, an attempt was made to place free floating Dan buoys in the expected area of fall out approximately 48 hours prior to shot time. For Shot 1, which was the only shot that was fired according to the original schedule, the Dan buoys were in position, however, a last minute change in the wind direction carried most of the fall out in a direction 180° from the area in which the Dan buoys had been deployed. On succeeding shots, it was impossible to deploy the full array of Dan buoys because of the necessity for maintaining a capability to fire on 18 hours advance notice. An abbreviated array was worked out in order to permit the deployment of some 12 to 14 Dan buoys in a period of approximately 18 hours. However, last minute shot cancellations, together with insufficient time to recover unused buoys, recharge batteries, etc., resulted in successful participation in only one of the remaining 5 events. Naval support requirements for this phase of the fall out project consisted of two ATF's for laying and recovering the buoys, plus suitably equipped search aircraft to assist in recovery. A Naval patrol squadron was designated to provide this support, however their primary mission was security patrol of the Pacific Proving Grounds (PPG) danger area and the frequency of the patrol flights was greatly increased by the many postponements. This resulted in a substantial increase in their flying time, and they were not able to support the fall out project. As was the case with project 1.4, the Navy Task Group made every effort, within its limited capabilities, to support the free floating Dan buoy project. For Shot 5, a plan involving water sampling was put into effect in an effort to document the long range fall out. Very encouraging results were obtained, and after complete analysis of the data it may be concluded that the water sampling technique is entirely adequate as a means of documenting long range fall out from shots fired at Bikini or Eniwetok. The support required was considerably less than for the Dan buoy method and operational problems were relatively simple. It was tentatively concluded that an ATF type vessel such as was used for Shot 5 was not entirely adequate and probably a destroyer or patrol craft (PC) type vessel would be more suitable.

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(d) Program 3. This program originally consisted of three individual projects; one designed to determine the load on an idealized cubical structure; one to obtain the dimensions of the craters formed by several of the shots; and the third to determine the effects of blast on a natural tree stand. Late in January, Project 3.4, a Navy project, was set up to determine the effects of high yield explosions on a planted sea mine field. After the first shot, Project 3.5 was initiated by Task Unit 13 to document the unexpected damage which occurred to various structures as a result of the shot. No significant operational problems resulted from the conduct of these projects. The crater survey was performed by means of a specially equipped small landing craft (LCU) utilizing a conventional ship's fathometer. Positioning of the LCU was accomplished by means of Raydist equipment which had been borrowed by the project group for this operation. This equipment did cause considerable difficulty, however, the difficulty could be traced directly to the fact that the equipment was borrowed; had been extensively modified; and was being operated by personnel who were not thoroughly familiar with it. Fortunately, the Raydist technicians who were in the forward area to operate similar equipment for positioning the effects aircraft were able to assist in setting up the equipment, checking it out and eliminating some of the operational difficulties. It is interesting to note that with the addition of the mine field project, three support ships, a destroyer mine sweeper (DM), a salvage and rescue tug (ARS) and a landing ship tank (LST) were immediately made available by the Navy. This would seem to indicate that had the Task Force requested adequate Naval support during the planning phases of the operation, sufficient support could have been made available for all projects.

(e) Program 4. Program 4 was established after the first shot in order to document such information as could be obtained as a result of the unexpected exposure of a large number of Marshallese natives. The program operated at Kwajalein from shortly after Shot 1 until approximately 1 May. A group of medical personnel under the direction of CDR Cronkite of the Naval Medical Research Institute moved from the ZI to Kwajalein where the evacuees had been taken for medical care and treatment. The only operational difficulties experienced in connection with this program were those which are usually experienced when a test project is set up and put into an operation on extremely

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short notice. The majority of the medical supplies and equipment were either brought from the ZI or were furnished by the station medical officer at Kwajalein. TU-13 was called upon to assist in the expediting of shipments of specimens to the ZI and of high priority equipment and supplies from the ZI. For future operations consideration might be given to establishing within the ZI a complete group of medical personnel who would be available on short notice to move overseas for the purpose of observing and treating personnel inadvertently exposed to radiation.

(f) Program 6. Program 6 consisted of five unrelated projects involving the evaluation of the effectiveness of current Indirect Bomb Damage Assessment (IBDA) capabilities; the determination of blast and thermal effects on two types of aircraft; the evaluation of shipboard atomic warfare countermeasures; a study of the effectiveness of various means of decontaminating construction materials and lastly studies of the effects of high yield detonations on the ionosphere.

1. The IBDA project was relatively simple from the operational standpoint since it consisted of three B-50 type SAC aircraft orbiting in prescribed positions at the time of burst and recording by means of cameras the record of the burst as seen on the aircraft radar sets.

2. In the study of the effects of thermal radiation and blast on aircraft, one B-47 and one B-36, both specially instrumented, participated in all shots. Their actual position in space was calculated prior to the shot on the basis of the best available information. As the operation progressed and as more actual data became available, it was possible to position these aircraft to receive close to 100 per cent of their designed limit loads. During each shot, the aircraft were controlled by the Air Operations Center which was located for all Bikini shots aboard the USS Estes. In addition, their positions were checked after each shot by means of Raydist equipment. Neither of the aircraft suffered more than minor visible damage. However, the instrumentation recorded data which will be of considerable value in determining the delivery capabilities of these two types of aircraft.

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3. Late in December 1955, after discussion with the project personnel and Task Group 7.4, it was decided that a contract should be let to the Hastings Instrument Company for the installation and operation of Raydist positioning equipment. This equipment appeared to be extremely simple in design and operation and would apparently provide the desired accuracy in positioning the effects B-36 and B-47. The contract provided for the rental of the necessary equipment plus the services of four Raydist technicians to assist in the installation and operation of the equipment in the forward area. The equipment was assembled hastily during January and shipped to the forward area, arriving approximately 1 February. Numerous difficulties arose in connection with the installation of the various electronic units at Bikini. Most of these difficulties could be traced to insufficient preparatory work prior to the movement overseas. Some units were faulty, others were incomplete and all of the equipment was highly susceptible to corrosion. Operations in the forward area were hampered considerably by lack of proper security clearances for the Raydist technicians. It was necessary to provide an escort for these individuals and this restricted their movements, which resulted in inadequate attention to the equipment during the installation period. Fortunately, it was possible to install the master control station aboard the USS Curtiss where a military Secret clearance was sufficient. Also, it was possible to install one of the transmitter stations on Bikini Island where no special security clearance was required. The cooperation of the Commanding Officer of the USS Curtiss was responsible to a large degree for the successful operation of the Raydist equipment. After the third shot, the possibility of severe damage to the Raydist stations because of wave action, plus the fact that two of the remaining four shots were scheduled to be fired at Eniwetok, resulted in a decision to move the Raydist equipment from Bikini to Eniwetok. This was accomplished expeditiously and the equipment was set up under much more favorable conditions at Eniwetok since it was possible to manually operate all but one of the stations. At Bikini all stations except the master station had to be operated remotely. Unfortunately, one of the two shots scheduled for Eniwetok was cancelled after the equipment had been moved, however, excellent results were obtained on the last shot in the series which was fired at Eniwetok.

4. Two drone Liberty ships, one of them equipped with an automatic wash down system, participated in

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four of the six events for the purpose of determining the effectiveness of the wash down system in reducing the levels of contamination resulting from exposure to high levels of radiation from fall out. This was one of the most difficult projects to accomplish from an operational standpoint and involved the largest group of individuals of any of the DOD projects. The general plan of operation involved steaming the ships from Eniwetok to Bikini, evacuating the crews at sea at approximately H-2 hours and then steaming the ships under remote control through the fall out area. At approximately H/6 hours, the ships were taken in tow and moved back to Eniwetok for decontamination and preparation for the next scheduled event. An unfortunate shift in the surface and lower level winds just prior to Shot 1 resulted in rather disappointing results from this shot. However, in the succeeding shots in which the ships participated, high levels of contamination were received on the ships, and the project was considered to be successful. Because of the effectiveness of the wash down system and the shielding which was available below decks, a small crew manned the wash down protected ship during the last two shots in which the project participated. Decontamination personnel were provided by Task Group 7.3 from the crews of various ships in the Task Group. In conjunction with the drone ship project, representative panels of typical construction materials were exposed aboard both the protected and unprotected ships. Upon recovery after the shot, these panels were decontaminated utilizing various standard and experimental techniques.

8. The ionosphere studies were carried out by a Signal Corps group operating special ionosphere recorders at Rongerik Atoll, Eniwetok Atoll and Okinawa. The station at Rongerik was heavily contaminated by fall out from the first shot and had to be evacuated. However, it was possible to reactivate the station for succeeding events by sending in an operating crew either by sea plane or surface vessel a couple of days prior to the shot. These personnel would activate the station and then return after the shot to recover the records. Three Signal Corps men who were operating the Rongerik station at the time of the heavy fall out from Shot 1, were initially evacuated to Eniwetok Island because it was believed that they had received a total dose of approximately 90-100 r radiation. It was the desire of the medical personnel conducting Project 4.1 at Kwajalein to have these men report to Kwajalein for observation. Commander, Joint Task Force 7 opposed this request on the grounds that the psychological effect

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on the man would be detrimental. In order to make the move to Kwajalein more plausible, plans were made for the establishment at Kwajalein of an ionosphere recording station and the three exposed men were sent to Kwajalein to prepare a site for this station. It was decided subsequently to evacuate the men to Tripplor General Hospital in Honolulu from whence they were returned to the ZI.

(g) Program 7. This program consisted of the usual long range detection studies conducted by the Air Force Assistant for Atomic Energy (AFOAT-1). The only station operating in the forward area was an electromagnetic station which was set up at Bikini for Shot 1 and was later moved to Eniwetok for the remaining five shots.

(h) Program 8. This program included only one project designed to determine by photography, both aerial and ground, the significant parameters of the clouds resulting from each of the detonations. The ground photography was performed by Edgerton, Germeshausen and Grier and the aerial photography by the Lookout Mountain Laboratory. Three C-54 and one B-36 type aircraft equipped with gyro-stabilized camera mounts were utilized. The B-36 performed an additional mission for LASL of sampler control and the C-54's had an additional mission of obtaining documentary photography for the Task Force. The two conflicting requirements imposed on both types aircraft somewhat jeopardized the success of the cloud photography project, although excellent results were obtained. For sampler control and for documentary photography, it was desirable to place the aircraft as close to the detonation as safety conditions would permit. For cloud photography studies it was desirable to place the aircraft at a considerable distance from the detonation so that the entire cloud could be contained in the frame of the camera. Reasonably satisfactory compromises were worked out for each shot. However, it was clearly demonstrated that for a thoroughly successful cloud photography experiment, aircraft must be assigned for this specific mission and any conflicting requirements must be met by other aircraft assigned for those purposes.

(4) Support Activities. The headquarters of Task Unit 15 provided many administrative services direct to the participating project groups. A complete message center for

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handling all incoming and outgoing classified and unclassified correspondence was operated independently of Task Group 7.1. Since most projects did not have adequate clerical assistance in the forward area, Task Unit 13 headquarters provided assistance in this respect. The control of all classified documents was handled by TU-13. In all other administrative matters TU-13 provided assistance to the projects by coordinating their requirements with the appropriate staff section of Task Group 7.1 and the other Task Groups.

(5) Engineering and Construction. All TU-13 requirements for on site construction and contractor-furnished support were processed by the J-6 section of TG 7.1. To insure proper coordination of these requirements CDR W. M. McLellan was assigned from DNWE to the J-6 section. He served in this capacity throughout the operational period of the test. The initial requirements from all DOD projects were obtained in May of 1953 and by November 1953 all major construction was well advanced. Small construction was held in abeyance until approximately December 1953 with the majority being accomplished during January and February 1954. The finish work including clean up and grading was accomplished during February 1954, at which time the individual project groups were represented in the forward area and were, therefore, available to advise on the acceptability of the various items. Routine daily support requirements during the operational period were handled directly by J-6 without reference to TU-13 headquarters. In most instances job work orders were written to cover the work required.

(6) Fiscal. By agreement between Commander, Joint Task Force 7 (JTF-7) and Chief, AFSWP, The Commanding General, Field Command, AFSWP retained control of all Research and Development funds required for the DOD effects program in Operation CASTLE. Extra-military funds were transferred by Headquarters, AFSWP to the Task Force and were available to finance appropriate TU-13 activities as required. The original Research and Development (R&D) budget was $7,361,750. This amount was broken down by programs, and on the basis of individual project estimates, was further broken down by projects within each program for control purposes. In addition, it was found convenient to further break down all R&D funds into two categories, Class I and Class II. Class I funds were those expended by the individual projects to defray

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expenses at their home laboratories and to finance their preparation for the operation as well as the cost of evaluating the data following the operation. Class II funds included those that were programmed for support of all projects and were expended by Field Command through TU-13. These included funds for construction and general support by the AEC contractor in the forward area; contracts, reports, photography, timing signals and supplies. The majority of the Class II funds were expended by the SFOO through their contract with Holmes and Narver. Early in January 1954, after the arrival of TU-13 in the forward area, it was possible to reestimate the actual construction costs for all of the individual projects. As a result, it was possible to reduce the overall R&D budget to six million dollars and in March $1,776,750 was declared excess and released to Headquarters, AFSWP. During the operational period a contingency of at least ten per cent of the total budget was maintained to meet unforeseen costs which, it was anticipated, would arise. This proved to be a wise decision, since the Raydist equipment contract required a sum of $270,000. The continued delays in the shot schedule resulted in substantial increases in the support budget, and Project 4.1 which was activated in March 1954 required a sum of $40,000.

(7) Supply and Transportation. TU-13 provided assistance to all participating project groups in obtaining the necessary supplies from the appropriate agencies in the forward area. In some instances it was necessary to purchase through the AEC contractor, however, no unusual difficulties were encountered. TG 7.1 maintained a well-stocked warehouse at Eniwetok and Bikini and all projects were authorized to draw expendable supplies from these warehouses. Surface and air transportation was provided through J-4 of TG 7.1. With the exception of the usual last minute high priority shipments just prior to and immediately following the operation, no usual problems arose in connection with transportation. Fund citations to cover the costs of shipping cargo from the Port of Embarkation to the home installation of each project after the operation were obtained from each project agency prior to the beginning of the operation. These funds were then cited on shipping documents and GBL's by the Task Group transportation personnel, thus eliminating the usual holdups at the Port of Embarkation.

(8) Radiological Safety. During Operation CASTLE, an effort was made to utilize project personnel as rad-safe

monitors on the recovery missions. During the fall of 1953, selected individuals from each project group attended a short rad-safe course conducted by TG 7.1 at the NPG, designed to qualify the individuals as monitors. In addition to the individual project monitors, TG 7.1 had available in the forward area a limited number of full-time monitors. Within TU-13 headquarters, one officer was designated to monitor and coordinate all rad-safe matters, and reasonably accurate dosage records on all personnel were maintained. The high levels of contamination which resulted from several of the shots, together with the necessity for frequent entry into contaminated areas to service equipment during the long delay periods between shots, posed a serious problem to control of maximum permissible exposures for project personnel. Efforts were made to rotate personnel whenever possible, however, it was necessary to request waiver of the Maximum Personnel Exposure (MPE) in the case of several project personnel. In general, the system of placing monitoring responsibilities on the individual project groups worked very satisfactorily.

(9) Roll-up Activities. Roll-up activities began as soon as Shot 5 was fired at Bikini. Participation in Shot 6 at Eniwetok was rather limited and all instrumentation had been ready approximately three weeks prior to the actual shot date. It was, therefore, possible to utilize the time between Shot 5 and Shot 6 for report writing and roll-up preparations. To expedite submission of preliminary reports, many projects were directed to include only the data from the first five shots in their preliminary reports. After Shot 6 was fired, approximately one week was required to complete work in the forward area for all but a few projects. Headquarters of TU-13 departed on 19 May, leaving one officer to assist in final roll-up which was completed on 28 May 1954.

2. TEAPOT Activities

a. Development of High Altitude Device

(1) On 7 May 1954, the Chief, AFSWP, authorized the CG, Field Command, to take such action as was necessary to implement the design and procurement of a test device to meet the requirements for the high altitude shot of Operation TEAPOT. The CG,

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Field Command, in turn, designated DNWT as the organization to implement directives set forth.*

(2) On 3 June 1954, letters were dispatched to Sandia Corporation** and Air Force Special Weapons Center*** giving in detail the requirements which must be fulfilled in order to meet the criteria established for the high altitude tests. As indicated in reference ***, Headquarters, AFSWP desired first priority on a device to consist of a Mark V case with a total weight of 1500 lbs., utilizing the optimized 22" system with a forecast yield of approximately 2 MT. In the event that the optimized 22" system could not be made available, Sandia Corporation was requested to make provisions for the substitution of the [redacted] It was also specified that if the Mark V, 1500 lb. case was ballistically or operationally unsuitable, investigation of a Mark V, 5000 lb. (T-62) case should be made.

By mid June 1954, Sandia Corporation reported that the Mark V, 1500 lb. configuration was satisfactory and hence further work with the T-62's was discontinued. At this same time, Sandia Corporation reported that the optimized 22" system probably would not be available by the required date (early 1955) and that primary planning consideration was being given to the use of the [redacted] assembly.

b. Preplanning for Operation TEAPOT

(1) A planning group was established in Headquarters, AFSWP, to plan for and schedule military effects project participation in Operation TEAPOT by the three Services

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* Letter subject "Nuclear Device for High Altitude Shot, Operation TEAPOT" dated 7 May 1954, from AFSWP to CG, FC, AFSWP, SWPSI-T/600.12

** Letter subject "Nuclear Device for High Altitude Detonation, Operation TEAPOT" dated 3 June 1954, FCWT 54-644-C.

*** Letter, subject "Nuclear Device for High Altitude Detonation, Operation TEAPOT" FCWT 54-645-C, dated 3 June 1954.

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and/or other agencies.* This planning group has worked very closely with DNET (principally the Technical Division) on scientific, operational and budgetary matters, with a 1 July 1954 date set for transferring funds and assignment of the responsibility for the preoperational, operational and post-operational phases of Operation TEAPOT to Headquarters, Field Command (DNET, Technical Division).

(2) Conferences on Operation TEAPOT were held the first part of June to review the scientific requirements in detail, drawing up an integrated experimental plan with the requirements of all the interested projects. Conferees numbering over fifty, represented Headquarters, AFSWP, Air Force Special Weapons Center, Naval Research Laboratory, Naval Radiological Defense Laboratory, Naval Ordnance Laboratory, Edgerton, Germeshausen and Grier, Inc., Los Alamos Scientific Laboratory, Cambridge Research Center, Evans Signal Laboratory, Sandia Corporation, Massachusetts Institute of Technology, Stanford Research Institute and DNET. Areas of responsibility were defined and where certain projects had mutual or overlapping interests, these problems were recognized and steps were taken to delegate certain duties to the projects of the respective laboratories and agencies. Too, requirements for the operational groups were more firmly established.

5. Reports Branch Activities

a. Military effects reports are those related directly to the gross effects of nuclear detonations, such as blast, total radiation and damage to military equipment. Instructions as to content, format, preparation of illustrations, photographs, etc., are contained in A Guide for the Preparation of Effects Tests Reports.**

* Time Schedule-Operation TEAPOT for Preliminary Planning Purpose Only (Fourth Revision) (Supersedes previous revisions) dated 21 April 1954.

** A Guide for the Preparation of Effects Tests Reports, by AFSWP, dated 30 November 1953, available in DNET Files.

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b. During this period fifteen UPSHOT-KNOTHOLE final reports were reviewed by the Technical Editor, classified, processed and forwarded to the Technical Information Service, Atomic Energy Commission, Oak Ridge, Tennessee (TISOR), for printing and distribution. Classification review of these reports was handled through the Test Classification Office, LASL.* The distribution was made in accordance with information received from Headquarters, AFSWP.

c. Preliminary reports were required of all projects participating in Operation CASTLE. Their content consisted of an abstract, objectives, experiment design, results and observations, discussion, conclusions and/or recommendations.**

d. The military effects reports for Operation CASTLE were handled by the Reports Branch, DNET.***

e. Approximately one month after completion of Operation CASTLE, the preliminary reports (34 in number) had been edited (most of this was done at the Pacific Proving Grounds), classified, processed and forwarded to the TISOR for printing and distribution. Classification was made by the Classification Officer, JTF-7. Distribution was determined by the Reports Branch, Headquarters, AFSWP, granted Field Command the authority to act as reviewing agent for the CASTLE preliminary reports.**** This included the determination of the distribution as well as the publishing.

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* Ops Order No. 1-53 (U-K) Annex S-Technical and Scientific Reports

** Letter, Hq, TU-13, Field Command, AFSWP, subject "Preliminary Reports, Operation CASTLE," dated 18 August 1953.

*** Annex E, Technical Reports to TG 7.1, Adm Plan, dated 15 October 1953, pp E-1 - E-3.

**** TWX from Chief, AFSWP, SWPEF 52190, dated 18 May 1950.

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f. On 17 June DWET was host for the first time to the AEC-DOD Weapons Test Reports Committee. This is an informal committee which meets twice a year for the purpose of resolving problems connected with the publication and distribution of weapons tests reports. Personnel from DMA, LASL, UCRL, Headquarters, AFSWP, TISCR and DWET are represented on the committee.

g. Points of interest brought out by the Committee while at Sandia Base and Los Alamos (18 June) were as follows:

(1) The TISCR is presently publishing weapons effects data received from the inter-exchange of data with the British on their atomic explosion. This information will be available in the Technical Library, Sandia Base.

(2) Operation WIGWAM (underwater detonation in Spring 1955) reports will be prepared by a reports group to be established within the Task Force to be organized for the operation in the Spring of 1955.

(3) TISCR will continue to publish the weapons test reports for the DOD and the final reports of Operation UPSHOT-KNOTHOLE.

(4) The next meeting of the Committee is scheduled for Washington, D. C. during the middle of January 1955. Members of Headquarters, Technical Information Service, AEC, will be the host.

(5) Summary Status Report Weapon Test Reports Committee dated 10 May 1954 gives the history of the AEC-DOD Weapons Test Reports Committee.*

* Summary Status Report, by Dale Evans, Lucie Connally and R. A. Burgin available in DWET files.

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4. Requirements Branch Activities

During the period the rear echelon of the Requirements Branch remained at Kamdia Base, work consisted of carrying out routine engineering and design work in general support of the Directorate. The majority of the engineering effort was expended on the design of support facilities to further the mission of the Directorate in future operations at the Nevada Proving Grounds. Requirements forms were completely revised to streamline them by eliminating past requested information which experience has shown is no longer required. This streamlining was pointed toward reducing the burden on the participating projects. Revised forms were published and prepared for distribution. Drafting and equipment assistance was also provided to the Reports Branch to assist in the completion of the CASTLE preliminary reports.

B. Operations Division

1. General

(a) The activities of the Operations Division were less than normal for the period January to June 1954, due to the long interim period between continental tests. Positive action of the division consisted primarily in maintaining close liaison with Santa Fe Operations Office, Las Vegas Field Office, Los Alamos Scientific Laboratory and Special Weapons Center on Radiological Safety matters, communications and air weather problems.

(b) In February 1954, the Detachment Commander, Detachment 23, 4th Weather Group, Kirtland Air Force Base, in his role as Weather Project Officer for NPG tests and Air Weather Staff Officer for AFSWP, established an office in the Operations Division, DWET, to coordinate directly with program directors, SFOO, and LASL on their planning and operational problems of air weather service for atomic tests at NPG. From 15 March to 1 May 1954, this officer supervised a wind project at NPG to obtain data on the upper winds and to indoctrinate air weather personnel in the support of future continental atomic tests. The report of this operation contains the results of the forecasts prepared during this period and recommendations on air weather support for future continental atomic tests and will be available soon for distribution to Air Weather Service, SFOO, LASL and DWET.

2. Operations Branch

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a. The Operations Branch supervised the preparation of various revisions of the DNET organizational and functional charts to include an amendment to the DNET section in the Organization and Functions Booklet periodically published by Field Command, AFSWP. In the latter part of April a paper, "Proposed Plan for Operational Training and Troop Participation", was written in conjunction with a representative of Headquarters, AFSWP. In the absence of the Director of Program Nine, who was at the Pacific Proving Grounds throughout the operational phase of Operation CASTLE, assistance was rendered the Technical Division, DNET, in the custody, control and servicing of photographic materials.

b. Throughout the period, continuous liaison was maintained with the Training Division of the Operations Directorate, the Training Section within the Directorate of Personnel and Security and the Base I & E Officer relative to off-base and on-base training courses for DNET personnel. Action was taken to obtain quotas for the local Special Weapons Orientation Course (WO), the Special Weapons Orientation Course (Advanced) - WOA, the Special Weapons Employment Course (WE) and the Conference Leadership Course. In the case of USAFI correspondence courses and off-duty classes for DNET personnel, arrangements were made for direct communication with the I & E Office by personnel concerned. Four officers attended the WO course; three officers, the WOA course; and one officer, the WE course. Assistance was also extended to the Manager, Las Vegas Field Office, USAEC, for attendance of personnel of his office at the ABCD Course (Radiological Safety Phase), U. S. Naval School Command, Treasure Island, San Francisco, California.

3. Radiological Safety Branch

a. The Rad-Safe Officer, DNET, made bi-monthly inspections of the 1st Radiological Safety Support Unit (RSSU) at NPG. This unit (one officer and ten enlisted men on TDY from the Chemical Corps Training Command, Ft. McClellan, Alabama) assisted AEC contract personnel in the continuous police and decontamination of test areas within the Nevada Proving Grounds and repaired and serviced , as time and availability of personnel permitted, radiac instruments and equipment used during previous operations. The Commanding Officer, Chemical Corps Training Command, Fort McClellan, Alabama was requested to procure for assignment to the

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1st RSSU three enlisted men with a background in electronics for on-the-job training at NPG in the repair of radiac instruments which will be used in the next operation. Permission was also granted to use personnel of the 1st RSSU to support DCD requirements at NPG in other than radiological safety during slack periods. A letter was prepared and forwarded to the Officer-in-Charge, NPG Detachment, amending a previous letter of instructions dated 21 December 1953 with respect to his specific relations and responsibilities with the Rad-Safe Detachment at NPG. A review of non-expendable radiological safety equipment needed for future test series at NPG was made and a request was placed with the Manager, SFO, USAEC, for the purchase of 150 pocket dosimeters of the 0-5 roentgen range. It was determined that these dosimeters would be the only major non-expendable items of equipment needed for Operation TEAPOT.

b. In January, action was initiated through Headquarters, AFSWP, to permit a larger cumulative dose during test periods for DCD test personnel not normally working with radiation (15r on a yearly basis rather than only 3.9r for the entire test series).

c. Throughout the period, the Rad-Safe Officer maintained constant and profitable liaison with SFOO, LVFO and LASL. A letter was sent to the Manager, SFO, USAEC, outlining the views of this Directorate on air sampling requirements for off-site radiological safety at NPG. A draft of an off-site radiological plan for the NPG to be published by Santa Fe Operations, USAEC, was reviewed by the Radiological Safety Officer, DWEF, and a letter submitted to SFO with suggestions on permissible contamination levels, the use of radiological safety support aircraft including cloud trackers and air-to-ground survey aircraft and the responsibility for closing and opening the Civil Aeronautics Administration (CAA) air lanes. A policy and procedure directive soon to be issued by the Manager, SFO, USAEC on the control and disposition of contaminated materials at NPG was reviewed, and minor changes including the exemption of Desert Rock material and equipment were recommended. A set of specifications to be used in the purchase of pocket dosimeters for NPG was recommended to the Manager, Las Vegas Field Office (LVFO), USAEC. That office was further furnished data from tests made on Cambridge Corporation and Victoreen dosimeters. This office also assisted the Manager,

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SFO in the preparation of data to be later used in refuting a $200,000 lawsuit resulting from the continental test series in Nevada during the Spring of 1953.

d. In early May during an inspection of the 1st RSSU at NPG the Rad-Safe Officer, DWET, discussed Rad-Safe matters with the Manager, Las Vegas Field Office, USAEC. The Manager agreed to purchase 5,000 additional film badges, 2 vacuum tube voltage regulators and 500 large size fatigue suites. It was also agreed to utilize the two Rad-Safe photo-dosimetry technicians presently on duty at NPG as official AEC photographers during the non-operational periods.

e. In May, the Rad-Safe Officer, DWET, visited Fort McClellan, Alabama for conferences with the Commanding Officer, 1st RSSU and the Commanding Officer of the Chemical Corps Training Command on matters of the 1st RSSU (personnel problems, decontamination apparatus for use at NPG, vehicles and training) and general Rad-Safe policies for the next test series. It was determined that the 1st RSSU should enter the TEAPOT Operation with 50% of its former UPSHOT-KNOTHOLE enlisted personnel. It was agreed that 1st RSSU's four authorized decontamination apparatus units should be at NPG for the TEAPOT Operation. DWET will order the spare parts for direct shipment to NPG as required. The present training at the school indicates that the 1st RSSU at NPG will be adequately augmented for future test operations to include the manning of the Instrument Repair Section. In the past, this work has been accomplished by the Signal Corps project personnel.

f. A letter was forwarded to the Air Materiel Command (AMC) to coordinate the use of AMC Rad-Safe teams in future continental atomic tests. Action was also taken with the National Bureau of Standards for the official calibration of the two Co^{60} sources in use at NPG. These sources will be used as standards for instrument calibration and dosimetry for Operation TEAPOT.

4. Communications Branch

a. In this period, liaison on communication matters was conducted with LVFO, SFOO, LASL and the Field Command Staff Officer for communications. The activation of communication

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facilities at NPG for the upper wind project for the period 15 March to 15 May 1954 was arranged with the Las Vegas Field Office, USAEC. Action was also taken to inform the Manager, LVFO, USAEC that present requirements indicated no need for the reservation of full period private telephone circuits at NPG, but the possibility of such a need should be a point for conservative planning. A study of the Communications Plan for NTS as drafted by the Las Vegas Field Office, USAEC, and forwarded by the Manager, SFO, was made by the Communications Officer, DWET. Comments of this Directorate will be forwarded to the Manager, SFO, USAEC, in early July 1954.

b. From 24 February to 18 May 1954, the Communications Officer, DWET, was on TDY at the Pacific Proving Grounds for duty with Task Unit 13 in Operation CASTLE. He performed the general duties of project liaison officer with the Raydist Radio Location System project and, in addition, acted as the designated field representative of the Field Command Contracting Officer relative to the Raydist Contract (No. DA-29-044-XE-368).

F. Support Division. Due to the inter-relationship of functions, those of the Support Division, DWET, and those of the NPG Detachment (less radiological safety) DWET, are combined and reported herein by subject.

1. Supply - There being neither a ZI test operation nor active preparation therefor during the period, supply activities were generally of a routine nature. Activities worthy of note:

a. DOD Program and Project units designated to constitute CASTLE Task Unit 13 were assisted in the implementation of certain logistical preparations such as the negotiation of a priority contract with the Raydist Corporation for special aircraft tracking devices.

b. The Field Command property account at the NPG, redesignated as SNP 1006 50 during this period, was inspected and given a satisfactory rating both by the Army Audit Agency and the Field Command Inspector General. These inspections, however, indicated a substantial number of technical errors. As a result, the property account was reorganized, rewarehoused and reinventoried.

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c. Property with an estimated value of more than $100,000, excess to foreseeable future requirements at the NPG, was disposed of through surplus and excess channels. Much of this property had been recovered from among that procured for tests prior to the designation of AFSWP as the operational agency.

2. Real Property - Negotiations were completed with the AEC relative to the ownership of over one hundred temporary structures located at the NPG. A large number of these structures were determined to be DOD property and were so recorded in Property Account SWP-1013-50 established in May 1954 for this purpose.

3. Test Equipment

a. The program of establishing AFSWP title to and recording of equipment purchased with AFSWP funds allocated for UPSHOT-KNOTHOLE projects was concluded. A revised edition of the AFSWP Catalog of Test Equipment and Related Items was published on 1 April 1954.

b. Considerable AFSWP owned and controlled test equipment, recaptured and recorded as a result of ZI tests, was utilized in support of Operation CASTLE. In addition to substantial but unknown quantities of such equipment taken to CASTLE by DOD agencies holding temporary custody, a number of items were shipped from the NPG. This latter category included equipment such as data recording devices, generators and a large shop trailer.

c. Test equipment remaining in the custody of DWKT at the NPG was repaired and rehabilitated in preparation for further test use. This program included major overhaul of approximately 40 gasoline and diesel powered generators.

4. Transportation and Maintenance

a. The DWKT NPG maintenance shop expended considerable effort during this period in the rehabilitation of approximately 75 vehicles required for the priority establishment of Lake Mead Base.

b. During this period, as a matter of overall DOD economy, the DWKT motor maintenance facility at the NPG continued to maintain all vehicles required in support of the Camp

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Desert Rock custodial force. This action continued to permit complete elimination of all motor pool and motor maintenance activities within Camp Desert Rock.

6. Programming and Control of Test Funds

a. On the basis of experience gained through the implementation of an UPSHOT-KNOTHOLE agreement covering the allocation of NPG expenses between the AEC and the DOD, a revised indefinite period agreement was negotiated and signed by the Manager, SFOO, AEC, and the CG, FC. This represented the first long range cost allocation agreement usable for budget purposes.

b. On the basis of previous experience, DNET representatives negotiated an understanding with AEC representatives by which more useful information would in the future be obtained relative to DOD funds expended through AEC for activities at the NPG. This agreement, not completely confirmed by 30 June, provided, among other things, for a breakdown of purposes for which DOD funds were expended by the AEC. It also provided for AEC publication of a statement covering the policy by which overhead charges would be allocated to DOD construction and other support provided by AEC at the NPG.

c. During June, it was determined that there existed no further requirement for programming and allocation of UPSHOT-KNOTHOLE funds. As a result, the balance of UPSHOT-KNOTHOLE funds was released to Hq, AFSWP, for reprogramming.

d. As Operation CASTLE progressed, CASTLE R & D funds were reprogrammed to the end that the total estimated R & D cost of DOD effects tests were decreased from $7,778,750 as of 1 January 1954 to $5,611,000 as of 30 June 1954.

e. Experience previously gained concerning Extra-Military costs of ZI tests was analyzed during this period, and an Extra-Military budget for the forthcoming ZI test was developed. This action indicated both that accumulative experience permitted a more accurate estimate and that Extra-Military costs of ZI effects tests were decreasing due in part to the fact that previously acquired equipment could be reused.

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6. Personnel

a. Two significant personnel difficulties were experienced during this period. First, CASTLE experience indicated that the authorized strength of the DWET Technical Division was inadequate to support the newly assigned DWET mission of concurrently providing effects technical direction for one operation while continuing preliminary planning for a second. A second difficulty was the inability to obtain qualified supply personnel for operation of the DWET property account at the NPG. This second problem had not been completely resolved by 30 June.

b. To correct the first of these difficulties, the Commanding General, Field Command, approved in May 1954 a new DWET organization providing for a more effective internal utilization of personnel and increasing the DWET strength from 90 to 99 positions. In consideration of the urgent DWET need to promptly utilize all 99 positions, the Assistant Chief of Staff, Field Command, authorized the utilization of all positions prior to receipt of approved allocations from the Army, Navy and Air Force.

c. During this period, negotiations were completed and confirmed whereby Field Command would consolidate and obtain for the AEC all augmentation military personnel which AEC and AEC sponsored projects would in the future require for SI effects tests. In the past, such augmentation personnel had been procured by AEC from several different DOD sources.

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